

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

Claim 1 (Currently amended)

A circuit for modeling a ~~course-~~ coarse delay element with a plurality of fine delay elements for a delay locked loop, the circuit comprising:

first and second parallel delay paths receiving a clock signal, the first path including a first plurality of delay elements and the second path including a second plurality of delay elements, ~~all of the first plurality of delay elements and the second plurality of delay elements being active for delaying the clock signal to provide first and second clock delay signals;~~

a phase detector for receiving the first and second clock delay signals from the first and second delay paths respectively, for detecting a phase difference between said first and second clock delay signals, the phase detector providing the phase difference to a counter; and

a decoder for receiving a signal from the counter, the decoder being connected to the first plurality of delay elements within the first delay path for adjusting the delay provided by the first delay path until the first and second clock delay signals are in a locked state, the delay lock loop including

a coarse delay line for receiving a system clock,

a fine delay line coupled to an output of the coarse delay line for providing a delay clock signal, and

a main phase detector for receiving the system clock and the delay clock signal, the main phase detector coupled to a main fine counter, the main fine counter being adjusted by the signal from the counter for adjusting the fine delay line.

Claim 2 (Original)

The circuit according to claim 1 wherein the first plurality of delay elements comprise programmable delay elements.

Claim 3 (Original)

The circuit according to claim 1 wherein the first plurality of delay elements comprise programmable digital delay elements.

Claim 4 (Original)

The circuit according to claim 1 wherein the second plurality of delay elements comprise the same delay elements of the first plurality of delay elements in addition to a coarse delay element.

Claim 5 (Original)

The circuit according to claim 1 wherein the second delay path comprises at least one coarse delay element.

Claim 6 (Original)

The circuit according to claim 1 wherein the second delay path comprises at least one coarse delay element in addition to the first delay path.

Claim 7 (Currently amended)

The circuit according to claim 2 1 wherein the first delay path consists of fine delay elements.

Claim 8 (Original)

The circuit according to claim 1 wherein the phase detector comprises a flip-flop circuit.

Claim 9 (Original)

The circuit according to claim 1 wherein the counter is a count-up count-down type counter.

Claim 10 (Cancelled)

Claim 11 (Currently amended)

The circuit according to claim 40 1 wherein the counter is coupled to the main fine counter.

Claim 12 (Currently amended)

The circuit according to claim 11 wherein a the signal provided by the counter to the main fine counter is substantially equal equivalent to the a number of delays provided by the fine delay elements within the fine delay line that correspond to a delay provided by a coarse delay element within the coarse delay line.

Claim 13 (Currently amended)

A circuit for modeling a ~~course~~ coarse delay element with a plurality of fine delay elements for a delay locked loop, the circuit including comprising:

(a) first and second parallel delay paths receiving a clock signal, the first path comprising a first plurality of delay elements and the second path including a second plurality of delay elements, ~~all of the first plurality of delay elements and the second plurality of delay elements being active for delaying the clock signal to provide first and second clock delay signals;~~

~~(b) a phase detector for~~ receiving the first and second clock delay signals from the first and second delay paths respectively, and for detecting a phase difference between said first and second clock delay signals, the phase detector providing the phase difference ~~to a counter; and~~

~~(c) the a counter for receiving the phase difference from the phase detector and for generating a signal for controlling a plurality of delay elements within the first delay path for adjusting the- a delay provided by the first delay path until the delay provided by the first and second paths are substantially equal- ,~~ the delay lock loop including
a coarse delay line for receiving a system clock,
a fine delay line coupled to an output of the coarse delay line for providing a delay clock signal, and
a main phase detector for receiving the system clock and the delay clock signal, the phase detector coupled to a main fine counter, the main fine counter being adjusted by the signal from the counter for adjusting the fine delay line.

Claim 14 (Original)

The circuit according to claim 13 wherein the first plurality of delay elements comprise programmable delay elements.

Claim 15 (Original)

The circuit according to claim 13 wherein the first plurality of delay elements comprise programmable digital delay elements.

Claim 16 (Original)

The circuit according to claim 13 wherein the second plurality of delay elements comprise the same delay elements of the first plurality of delay elements in addition to a coarse delay element.

Claim 17 (Original)

The circuit according to claim 13 wherein the second delay path comprise at least one coarse delay element.

Claim 18 (Original)

The circuit according to claim 13 wherein the second delay path comprise at least one coarse delay element in addition to the first delay path.

Claim 19 (Original)

The circuit according to claim 13 wherein the first delay path consists of fine delay elements.

Claim 20 (Original)

The circuit according to claim 13 wherein the phase detector comprises a flip-flop circuit.

Claim 21 (Original)

The circuit according to claim 13 wherein the counter is a count-up count-down type counter.

Claim 22 (Cancelled)

Claim 23 (Currently amended)

The circuit according to claim ~~22~~ 13 wherein the counter is coupled to the main fine counter.

Claim 24 (Currently amended)

The circuit according to claim 23 wherein ~~a~~ the signal provided by the counter to the main fine counter is substantially equal equivalent to a ~~the~~ number of delays provided by the fine delay elements within the fine delay line that correspond to a delay provided by a coarse-delay element within the coarse delay line.

Claim 25 (Cancelled)

Claim 26 (Cancelled)